

soldered connection between the pipe and undulating periphery of the strap or support. Further, at least one end, and preferably both ends of the support or strap are fastened to a building support, such as a stud.

[0016] The present invention also provides a plumbing strap for supporting a pipe, where the strap has a peripheral edge defining an opening in the strap with the opening configured to support the pipe extending through the opening during use of the strap. The opening has a first diameter, comprising: a circumference of the opening, which circumference is less than a length of the peripheral edge of the support defining the opening. The peripheral edge is preferably formed by an undulating edge, and ideally the undulating edge extends on opposing sides of the strap.

[0017] The undulations strengthen the periphery of the opening. There is thus advantageously provided undulating means cooperating with the periphery for increasing the stiffness of the support at the opening and increasing the length of the peripheral edge contacting the tubing.

[0018] The present invention also includes the method of supporting a pipe or tubular member using the features of the apparatus of this invention. There is thus provided a method of holding a pipe, comprising several non-sequential steps. The steps are non-sequential because the order can be changed. The steps include fastening at least one end of a support to a building structure, and placing the pipe through an opening in the support, with the opening having an undulating peripheral edge defining the opening. These steps can be further varied by soldering the pipe to the periphery, with the periphery extending on opposing sides of the strap. The further step of fastening an opposing end of the support to a building structure can also be performed, preferably before the soldering step.

[0019] The invention also includes the steps of manufacturing the support or strap described herein. The manufacturing sequence punches out one or more openings for the pipe and preferably one or more holes for fastening the support or strap to a building structure. The undulations are formed next by stamping the periphery of the opening or openings. Next, the opening (s) with the undulations is punched out to define a circular opening and to also preferably make the edge of the undulating opening be parallel to the axis of the tubing that will extend through the opening. The punching step is preferably done while supporting the undulations to prevent deformation of the

undulations, although the supporting step could be omitted. The holes for fasteners could be formed after the fluted opening(s) is formed.

[0020] Turning to the improved protector for the ends of the pipes, a protective cover is provided that fits over the end of a pipe. A first end of the cover is open to fit over the open end of the pipe. An opposing end of the cover is closed. Intermediate the cover and the enclosed end of the pipe a seal is interposed to provide a seal sufficient to permit pressurization of the pipe without removing the cover. Advantageously, the cover provides a radial seal with the pipe. A radial seal can be provided by moving two opposingly inclined surfaces toward each other to create a radial sealing force.

[0021] Advantageously, the cover is removably connected to the support or strap to restrain longitudinal movement of the cover along the length of the pipe to which the cover is connected. Advantageously, projections on a first end of the cover cooperate with openings in the strap to releasably hold the cover to the strap. A bayonet type mount or a snap-in type of connection are believed suitable. Preferably, there is a radial or axis seal between the cover and the pipe or tubing sufficient to prevent leakage of fluid from the cover. The cover can be placed over the pipe without being connected to the strap, especially if the seal is provided as the seal can resist removal of the cover from the pipe. But preferably the cover is connected to the strap. The cover can be connected to a plumbing support that has the undulating edge as described herein, or it can be connected to a strap without the undulating edge.

[0022] There is thus advantageously provided a fluid tight cover having a first, open end sized to fit over the pipe during use of the device. The cover has projections extending beyond the open end and located to correspond with the location of the slots on opposing sides of the holes. The projections are sized to engage the slots to fasten the cover to a pipe support. The cover has a closed, distal end that extends beyond the distal end of the pipe during use of the device. A radial seal can be provided on the inside of the cover, with the seal located to sealingly contact the pipe when a pipe extends through one of the holes during use of the device. Alternatively, an axial seal can be placed on the inside of the cover, with the seal sized and located so the seal will be sealingly interposed between the cover and a distal end of a pipe extending through one of the holes during use of the device when the projections engage the slots. Further, the cover can have a removable distal end

with the seal located so that the seal is axially compressed between the removable distal end of the cover and the distal end of the pipe during use of the plumbing device. Moreover, the cover can have a removable distal end with the radial seal being further compressed or held in position by the removable cover.

[0023] Other objects and features of the invention will be come apparent from consideration of the following description taken in connection with the accompanying drawings, in which like numbers refer to like parts throughout.

Description of the Drawings

- [0024] Figure 1 shows a support of this invention;
- [0025] Figure 2 shows an enlarged view of a portion of a support of this invention;
- [0026] Figure 3 shows a section along line 3-3 of Figure 2;
- [0027] Figure 4 shows a portion of a further embodiment support of this invention;
- [0028] Figure 5 shows an enlarged view of a portion of Figure 4;
- [0029] Figure 6 shows a section along line 6-6 of Figure 5;
- [0030] Figure 7 is a view along line 7-7 of Figure 5, with a tube through the bracket;
- [0031] Figure 8 is a plan view of a cantilevered support of this invention;
- [0032] Figures 9a, 9b are partial sectional views taken along 9-9 of Figure 5;
- [0033] Figure 10 is a partial sectional view of a further embodiment of an opening for a support of this invention;
- [0034] Figure 11 is a partial sectional view taken along 11-11 of Figure 10;
- [0035] Figure 12 is a view of a T-shaped support of this invention;
- [0036] Figure 13 is a view of an L-shaped support of this invention;
- [0037] Figure 14 is a sectional view of a pipe cover installed on the strap of Figure 1;
- [0038] Figure 15 is a side view of the pipe cover of Figure 14, with a double bayonet mount;
- [0039] Figure 16 is an end view of the pipe cover of Figure 15;
- [0040] Figure 17 is a section taken along section 17-17 of Figure 15;
- [0041] Figure 18 is a section taken along section 18-18 of Figure 16;
- [0042] Figure 19 is a section taken along Section 19-19 of Figure 17;